

1992 Index

IEEE Transactions on Knowledge and Data Engineering

Vol. 4

This index covers all items — papers, correspondence, reviews, etc. — that appeared in this periodical during 1992, and items from previous years that were commented upon or corrected in 1992.

The Author Index contains the primary entry for each item, listed under the first author's name, and cross-references from all coauthors. The Subject Index contains several entries for each item under appropriate subject headings, and subject cross-references.

It is always necessary to refer to the primary entry in the Author Index for the exact title, coauthors, and comments/corrections.

AUTHOR INDEX

A

- Ahad, Rafiul, *see* Basu, Amit, *T-KDE Dec 92 572-581*
 Ahamad, Mustaque, *see* Cheung, Shun Yan, *T-KDE Dec 92 582-592*
 Amin, Minesh B., *see* Shekhar, Shashi, *T-KDE Apr 92 177-185*
 Ammar, Mostafa H., *see* Cheung, Shun Yan, *T-KDE Dec 92 582-592*
 Antsaklis, Panos J., *see* Sartori, Michael A., *T-KDE Jun 92 290-297*
 Apers, Peter M. G., Carel A. van den Berg, Jan Flokstra, Paul W. P. J. Grefen, Martin L. Kersten, and Annita N. Wilschut. PRISMA/DB: A parallel, main memory relational DBMS; *T-KDE Dec 92 541-554*
 Arndt, Timothy, *see* Costagliola, Gennaro, *T-KDE Jun 92 205-222*

B

- Barbará, Daniel, Hector Garcia-Molina, and Daryl Porter. The management of probabilistic data; *T-KDE Oct 92 487-502*
 Bastani, Farokh B., *Guest Ed.*, *see* Iyengar, S. Sitharama, *Guest Ed.*, *T-KDE Apr 92 105-108*
 Basu, Amit, and Rafiul Ahad. Using a relational database to support explanation in a knowledge-based system; *T-KDE Dec 92 572-581*
 Berra, P. Bruce, *see* Hachem, Nabil I., *T-KDE Feb 92 68-82*
 Bertino, Elisa, Mauro Negri, Giuseppe Pelagatti, and Licia Sbattella. Object-oriented query languages: The notion and the issues; *T-KDE Jun 92 223-237*
 Bic, Lubomir, *see* Rundensteiner, Elke A., *T-KDE Aug 92 382-398*
 Bock, Peter, Roland Klinnert, Rudolf Kober, Richard M. Rovner, and Hauke Schmidt. Gray-scale ALIAS; *T-KDE Apr 92 109-122*
 Bodorik, Peter, J. Spruce Riordon, and James S. Pyra. Deciding to correct distributed query processing; *T-KDE Jun 92 253-265*
 Burger, Albert, *see* Kumar, Vijay, *T-KDE Dec 92 567-571*

C

- Cabrera, Luis-Felipe, *see* Lehman, Tobin J., *T-KDE Dec 92 555-566*
 Cardenas, Alfonso F., *see* Horowitz, Jeffrey R., *T-KDE Aug 92 360-370*
 Chang, Shi-Kuo, and Arding Hsu. Image information systems: Where do we go from here?; *T-KDE Oct 92 431-442*
 Chang, Tzy-Hey, and Edward Sciore. A universal relation data model with semantic abstractions; *T-KDE Feb 92 23-33*
 Chen, Wen-Tsuen, *see* Fang, Ming-Yi, *T-KDE Oct 92 475-486*
 Cheung, Shun Yan, Mostafa H. Ammar, and Mustaque Ahamad. The grid protocol: A high performance scheme for maintaining replicated data; *T-KDE Dec 92 582-592*
 Chin, Y. H., *see* Yan, Kuo-Qin, *T-KDE Jun 92 266-280*
 Chu, Pai-Cheng. Estimating block selectivities for physical database design; *T-KDE Feb 92 89-98*
 Costagliola, Gennaro, Genoveffa Tortora, and Timothy Arndt. A unifying approach to iconic indexing for 2-D and 3-D scenes; *T-KDE Jun 92 205-222*

D

- Danforth, Scott, and Patrick Valdurez. A FAD for data intensive applications; *T-KDE Feb 92 34-51*

E

- Egbert, Dwight D., Philip H. Goodman, Vassilis G. Kaburlasos, and John H. Witchey. Generalization capabilities of subtle image pattern classifiers (Concise p.); *T-KDE Apr 92 172-177*
 Elch, Margaret H., *Guest Ed.* Main memory databases: Current and future research issues (special section intro.); *T-KDE Dec 92 507-508*

F

- Faloutsos, Christos, *see* Lin, Zheng, *T-KDE Jun 92 281-289*
 Fang, Ming-Yi, and Wen-Tsuen Chen. Vectorization of a generalized procedure for theorem proving in propositional logic on vector computers; *T-KDE Oct 92 475-486*
 Flokstra, Jan, *see* Apers, Peter M. G., *T-KDE Dec 92 541-554*

G

- Garcia-Molina, Hector, *see* Barbará, Daniel, *T-KDE Oct 92 487-502*
 Garcia-Molina, Hector, and Kenneth Salem. Main memory database systems: An overview; *T-KDE Dec 92 509-516*
 Gasser, Les, *see* Ishida, Toru, *T-KDE Apr 92 123-134*
 Goodman, Philip H., *see* Egbert, Dwight D., *T-KDE Apr 92 172-177*
 Goodman, Rodney M., *see* Smyth, Padhraic, *T-KDE Aug 92 301-316*
 Gotthard, Willi, Peter C. Lockemann, and Andrea Neufeld. System-guided view integration for object-oriented databases; *T-KDE Feb 92 1-22*
 Greco, Sergio, Nicola Leone, and Pasquale Rullo. COMPLEX: An object-oriented logic programming system; *T-KDE Aug 92 344-359*
 Grefen, Paul W. P. J., *see* Apers, Peter M. G., *T-KDE Dec 92 541-554*
 Guh, Keh-Chang, and Clement Yu. Efficient management of materialized generalized transitive closure in centralized and parallel environments; *T-KDE Aug 92 371-381*

H

- Hachem, Nabil I., and P. Bruce Berra. New order preserving access methods for very large files derived from linear hashing; *T-KDE Feb 92 68-82*
 Han, Jiawei, *see* Youn, Cheong, *T-KDE Feb 92 52-67*
 Henschen, Lawrence J., *see* Youn, Cheong, *T-KDE Feb 92 52-67*
 Himes, Glenn S., and Rafael M. Iñigo. Automatic target recognition using a neocognitron (Concise p.); *T-KDE Apr 92 167-172*
 Horowitz, Jeffrey R., and Alfonso F. Cardenas. Decomposing heterogeneous inter-entity relationship updates; *T-KDE Aug 92 360-370*
 Hsu, Arding, *see* Chang, Shi-Kuo, *T-KDE Oct 92 431-442*

I

- Ichikawa, Tadao, *see* Wu, Xu, *T-KDE Oct 92 443-453*
 Iñigo, Rafael M., *see* Minnix, Jay I., *T-KDE Apr 92 162-167*
 Iñigo, Rafael M., *see* Himes, Glenn S., *T-KDE Apr 92 167-172*
 Ishida, Toru, Les Gasser, and Makoto Yokoo. Organization self-design of distributed production systems; *T-KDE Apr 92 123-134*
 Iyengar, S. Sitharama, *Guest Ed.*, and Farokh B. Bastani, *Guest Ed.* Self-organizing knowledge and data representation in distributed environment (special section intro.); *T-KDE Apr 92 105-108*

J

- Jensen, Christian S., and Leo Mark. Queries on change in an extended relational model (Concise p.); *T-KDE Apr 92 192-200*
 Johnson, R. G., and N. A. Lorentzos. Comments, with reply, on 'Extensions to SQL for historical databases' by N. L. Sarda; *T-KDE Aug 92 399* (Original paper, Apr 90 220-230)

K

- Kaburlasos, Vassilis G., *see* Egbert, Dwight D., *T-KDE Apr 92 172-177*
 Kashyap, Rangasami L., *see* Sull, Wonhee, *T-KDE Apr 92 185-191*
 Kennedy, David N., *see* Worth, Andrew J., *T-KDE Apr 92 156-161*

- Kersten, Martin L., *see* Apers, Peter M. G., *T-KDE Dec 92* 541-554
 Kim, Hyoung-Joo, *see* Youn, Cheong, *T-KDE Feb 92* 52-67
 Klinnert, Roland, *see* Bock, Peter, *T-KDE Apr 92* 109-122
 Kober, Rudolf, *see* Bock, Peter, *T-KDE Apr 92* 109-122
 Kumar, Devendra. Development of a class of distributed termination detection algorithms; *T-KDE Apr 92* 145-155
 Kumar, Vijay, and Albert Burger. Performance measurement of main memory database recovery algorithms based on update-in-place and shadow approaches (Corresp.); *T-KDE Dec 92* 567-571

L

- Lehar, Steve, *see* Worth, Andrew J., *T-KDE Apr 92* 156-161
 Lehman, Tobin J., Eugene J. Shekita, and Luis-Felipe Cabrera. An evaluation of Starburst's memory resident storage component; *T-KDE Dec 92* 555-566
 Leone, Nicola, *see* Greco, Sergio, *T-KDE Aug 92* 344-359
 Levy, Eliezer, and Avi Silberschatz. Incremental recovery in main memory database systems; *T-KDE Dec 92* 529-540
 Lin, Zheng, and Christos Faloutsos. Frame-sliced signature files; *T-KDE Jun 92* 281-289
 Litwin, Witold, and Tore Risch. Main memory oriented optimization of OO queries using typed datalog with foreign predicates; *T-KDE Dec 92* 517-528
 Lo, Raymond Wai-Man, and Norman S. Matloff. A probabilistic limit on the virtual size of replicated disk systems (Corresp.); *T-KDE Feb 92* 99-102
 Lockemann, Peter C., *see* Gotthard, Willi, *T-KDE Feb 92* 1-22
 Lorentzos, N. A., *see* Johnson, R. G., *T-KDE Aug 92* 399

M

- Mark, Leo, *see* Jensen, Christian S., *T-KDE Apr 92* 192-200
 Matloff, Norman S., *see* Lo, Raymond Wai-Man, *T-KDE Feb 92* 99-102
 McVey, Eugene S., *see* Minnix, Jay I., *T-KDE Apr 92* 162-167
 Minnix, Jay I., Eugene S. McVey, and Rafael M. Inigo. A multilayered self-organizing artificial neural network for invariant pattern recognition (Concise p.); *T-KDE Apr 92* 162-167

N

- Negri, Mauro, *see* Bertino, Elisa, *T-KDE Jun 92* 223-237
 Neufeld, Andrea, *see* Gotthard, Willi, *T-KDE Feb 92* 1-22

P

- Pasik, Alexander J. A source-to-source transformation for increasing rule-based system parallelism; *T-KDE Aug 92* 336-343
 Passino, Kevin M., *see* Sartori, Michael A., *T-KDE Jun 92* 290-297
 Pelagatti, Giuseppe, *see* Bertino, Elisa, *T-KDE Jun 92* 223-237
 Porter, Daryl, *see* Barabara, Daniel, *T-KDE Oct 92* 487-502
 Pyra, James S., *see* Bodorik, Peter, *T-KDE Jun 92* 253-265

R

- Raghunathan, Srinivasan. A planning aid: An intelligent modeling system for planning problems based on constraint satisfaction; *T-KDE Aug 92* 317-335
 Ramakrishna, M. V., and Edgar A. Ramos. Optimal distribution of signatures in signature hashing; *T-KDE Feb 92* 83-88
 Ramamoorthy, C. V., *Ed.-in-Chief*. Foreword (introduction to special issue on celebrating the 40th anniversary of the IEEE Computer Society); *T-KDE Oct 92* 405-406
 Ramos, Edgar A., *see* Ramakrishna, M. V., *T-KDE Feb 92* 83-88
 Rich, Charles, and Richard C. Waters. Knowledge intensive software engineering tools; *T-KDE Oct 92* 424-430
 Riordon, J. Spruce, *see* Bodorik, Peter, *T-KDE Jun 92* 253-265
 Risch, Tore, *see* Litwin, Witold, *T-KDE Dec 92* 517-528
 Robillard, Pierre-N., *see* Zeroual, Kacem, *T-KDE Jun 92* 238-252
 Rovner, Richard M., *see* Bock, Peter, *T-KDE Apr 92* 109-122
 Rullo, Pasquale, *see* Greco, Sergio, *T-KDE Aug 92* 344-359
 Rundensteiner, Elke A., and Lubomir Bic. Set operations in object-based data models; *T-KDE Aug 92* 382-398

S

- Salem, Kenneth, *see* Garcia-Molina, Hector, *T-KDE Dec 92* 509-516

- Sartori, Michael A., Kevin M. Passino, and Panos J. Antsaklis. A multilayer perceptron solution to the match phase problem in rule-based artificial intelligence systems (Concise p.); *T-KDE Jun 92* 290-297
 Sbattella, Licia, *see* Bertino, Elisa, *T-KDE Jun 92* 223-237
 Schmidt, Hauke, *see* Bock, Peter, *T-KDE Apr 92* 109-122
 Sciore, Edward, *see* Chang, Tzy-Hey, *T-KDE Feb 92* 23-33
 Shekhar, Shashi, and Minesh B. Amin. Generalization by neural networks (Concise p.); *T-KDE Apr 92* 177-185
 Shekita, Eugene J., *see* Lehman, Tobin J., *T-KDE Dec 92* 555-566
 Silberschatz, Avi, *see* Levy, Eliezer, *T-KDE Dec 92* 529-540
 Smyth, Padhraic, and Rodney M. Goodman. An information theoretic approach to rule induction from databases; *T-KDE Aug 92* 301-316
 Stonebraker, Michael. The integration of rule systems and database systems; *T-KDE Oct 92* 415-423
 Sull, Wonhee, and Rangasami L. Kashyap. A self-organizing knowledge representation scheme for extensible heterogeneous information environment (Concise p.); *T-KDE Apr 92* 185-191

T

- Tortora, Genoveffa, *see* Costagliola, Gennaro, *T-KDE Jun 92* 205-222

V

- Valduriez, Patrick, *see* Danforth, Scott, *T-KDE Feb 92* 34-51
 van den Berg, Carel A., *see* Apers, Peter M. G., *T-KDE Dec 92* 541-554
 Venkatesh, Santosh S. The science of making ERRORS: What error tolerance implies for capacity in neural networks; *T-KDE Apr 92* 135-144

W

- Wah, Benjamin W. Population-based learning: A method for learning from examples under resource constraints; *T-KDE Oct 92* 454-474
 Wang, Shu-Ching, *see* Yan, Kuo-Qin, *T-KDE Jun 92* 266-280
 Waters, Richard C., *see* Rich, Charles, *T-KDE Oct 92* 424-430
 Wilschut, Annita N., *see* Apers, Peter M. G., *T-KDE Dec 92* 541-554
 Witchey, John H., *see* Egbert, Dwight D., *T-KDE Apr 92* 172-177
 Worth, Andrew J., Steve Lehar, and David N. Kennedy. A recurrent cooperative/competitive field for segmentation of magnetic resonance brain images (Concise p.); *T-KDE Apr 92* 156-161
 Wu, Xu, and Tadao Ichikawa. KDA: A knowledge-based database assistant with a query guiding facility; *T-KDE Oct 92* 443-453

Y

- Yan, Kuo-Qin, Y. H. Chin, and Shu-Ching Wang. Optimal agreement protocol in malicious faulty processors and faulty links; *T-KDE Jun 92* 266-280
 Yeh, Raymond T. Notes on concurrent engineering; *T-KDE Oct 92* 407-414
 Yokoo, Makoto, *see* Ishida, Toru, *T-KDE Apr 92* 123-134
 Youn, Cheong, Hyoung-Joo Kim, Lawrence J. Henschen, and Jiawei Han. Classification and compilation of linear recursive queries in deductive databases; *T-KDE Feb 92* 52-67
 Yu, Clement, *see* Guh, Keh-Chang, *T-KDE Aug 92* 371-381

Z

- Zeroual, Kacem, and Pierre-N. Robillard. KBMS: A knowledge-based system for modeling software system specifications; *T-KDE Jun 92* 238-252

SUBJECT INDEX

A

- Abstracts; *cf.* Information retrieval
 Adaptive systems
 low-overhead delay method of adaptive strategy execution for distributed query processing. Bodorik, Peter, +, *T-KDE Jun 92* 253-265
 organizational self-design of distributed production systems. Ishida, Toru, +, *T-KDE Apr 92* 123-134

Adaptive systems; cf. Learning systems

Advisory systems; cf. Expert systems

Algebra; cf. Set theory

Artificial Intelligence

vectorization of generalized procedure for theorem proving in propositional logic on vector computers. *Fang, Ming-Yi, +, T-KDE Oct 92 475-486*

Artificial intelligence; cf. Expert systems; Intelligent systems; Problem-solving

B

Bibliographies

characteristics of object-oriented query languages and comparison with relational query languages. *Bertino, Elisa, +, T-KDE Jun 92 223-237*

FAD, database programming language for manipulating transient and persistent data on Bubba parallel database system. *Danforth, Scott, +, T-KDE Feb 92 34-51*

low-overhead delay method of adaptive strategy execution for distributed query processing. *Bodorik, Peter, +, T-KDE Jun 92 253-265*

population-based learning-from-examples method for designing heuristics automatically under resource constraints. *Wah, Benjamin W., T-KDE Oct 92 454-474*

Biomedical imaging, infrared

generalization capabilities of subtle image pattern classifiers; application to whiplash thermographs. *Egbert, Dwight D., +, T-KDE Apr 92 172-177*

Biomedical imaging, MRI

recurrent cooperative/competitive field for segmentation of magnetic resonance brain images. *Worth, Andrew J., +, T-KDE Apr 92 156-161*

Brain

recurrent cooperative/competitive field for segmentation of magnetic resonance brain images. *Worth, Andrew J., +, T-KDE Apr 92 156-161*

C

Coding/decoding

frame-sliced signature file superimposed coding method for text databases. *Lin, Zheng, +, T-KDE Jun 92 281-289*

Computation time

source-to-source transformation for increasing rule-based-system parallelism and improving execution time. *Pasik, Alexander J., T-KDE Aug 92 336-343*

Computer-aided software engineering

knowledge-intensive software engineering tools. *Rich, Charles, +, T-KDE Oct 92 424-430*

Computer fault tolerance

formal protocols for error tolerance in neural networks and resulting gains in capacity. *Venkatesh, Santosh S., T-KDE Apr 92 135-144*

optimal agreement protocol for distributed computing system with malicious faulty processors and faulty links. *Yan, Kuo-Qin, +, T-KDE Jun 92 266-280*

Computer fault tolerance; cf. Memory fault tolerance

Computer languages

FAD, database programming language for manipulating transient and persistent data on Bubba parallel database system. *Danforth, Scott, +, T-KDE Feb 92 34-51*

Computer languages; cf. Query languages; Visual languages

Computer networks; cf. Distributed computing

Computer performance; cf. Computation time; Computer...

Computer reliability; cf. Computer fault tolerance

Computers; cf. Distributed computing

Computer vision; cf. Object recognition

D

Database management systems

database management system for decomposing heterogeneous interentity relationship updates. *Horowitz, Jeffrey R., +, T-KDE Aug 92 360-370*

design and implementation of PRISMA/DB parallel, main-memory relational DBMS. *Apers, Peter M. G., +, T-KDE Dec 92 541-554*

incremental recovery in main-memory database systems. *Levy, Eliezer, +, T-KDE Dec 92 529-540*

integration of rule systems and database management systems. *Stonebraker, Michael, T-KDE Oct 92 415-423*

measuring performance of main memory database recovery algorithms based on update-in-place and shadow approaches. *Kumar, Vijay, +, T-KDE Dec 92 567-571*

system-guided view integration for object-oriented-database design. *Gotthard, Willi, +, T-KDE Feb 92 1-22*

Database management systems; cf. Database systems, query processing; Database systems, searching; Distributed database management systems; Memory management

Database systems

information-theoretic approach to rule induction from databases. *Smyth, Padhraic, +, T-KDE Aug 92 301-316*

main memory databases (special section). *T-KDE Dec 92 507-571*

Database systems; cf. Database management systems; Data models; Data structures; Distributed database systems; Image databases; Object-oriented databases; Query languages

Database systems, query processing

classification and compilation of linear recursive queries in deductive databases using graph models. *Youn, Cheong, +, T-KDE Feb 92 52-67*

data structure for efficient management of materialized generalized transitive closure in centralized and parallel environments. *Guh, Keh-Chang, +, T-KDE Aug 92 371-381*

KDA, knowledge-based natural-language database assistant with query guiding facility. *Wu, Xu, +, T-KDE Oct 92 443-453*

main-memory-oriented optimization of object-oriented queries using typed Datalog with foreign predicates. *Litwin, Witold, +, T-KDE Dec 92 517-528*

Database systems, query processing; cf. Distributed database systems, query processing

Database systems, relational

design and implementation of PRISMA/DB parallel, main-memory relational DBMS. *Apers, Peter M. G., +, T-KDE Dec 92 541-554*

estimating block selectivities for physical database design. *Chu, Pai-Cheng, T-KDE Feb 92 89-98*

probabilistic relational data model for representing probabilities associated with values of attributes. *Barbará, Daniel, +, T-KDE Oct 92 487-502*

queries on change in extended relational model. *Jensen, Christian S., +, T-KDE Apr 92 192-200*

using relational database to support explanation in knowledge-based system. *Basu, Amit, +, T-KDE Dec 92 572-581*

Database systems, relational; cf. Distributed database systems, relational; Query languages

Database systems, searching

conceptual framework for image information systems using generalized icons and active indexes. *Chang, Shi-Kuo, +, T-KDE Oct 92 431-442*

estimating block selectivities for physical database design. *Chu, Pai-Cheng, T-KDE Feb 92 89-98*

optimal distribution of signatures in signature hashing. *Ramakrishna, M. V., +, T-KDE Feb 92 83-88*

order-preserving access methods for very large files derived from linear hashing. *Hachem, Nabil I., +, T-KDE Feb 92 68-82*

Database systems, searching; cf. Information retrieval; Query languages

Data communication; cf. Distributed computing

Data management; cf. Database management systems; Distributed database management systems; Memory management

Data models

conceptual framework for image information systems using generalized icons and active indexes. *Chang, Shi-Kuo, +, T-KDE Oct 92 431-442*

probabilistic relational data model for representing probabilities associated with values of attributes. *Barbará, Daniel, +, T-KDE Oct 92 487-502*

queries on change in extended relational model. *Jensen, Christian S., +, T-KDE Apr 92 192-200*

universal relation data model with semantic abstractions. *Chang, Tzy-Hey, +, T-KDE Feb 92 23-33*

Data models; cf. Object-oriented databases

Data processing; cf. Database systems

Data structures

data structure for efficient management of materialized generalized transitive closure in centralized and parallel environments. *Guh, Keh-Chang, +, T-KDE Aug 92 371-381*

Delay effects

low-overhead delay method of adaptive strategy execution for distributed query processing. *Bodorik, Peter, +, T-KDE Jun 92 253-265*

Design methodology; cf. Database systems...; Production systems

Digital communication; cf. Coding/decoding

Digital system fault tolerance; cf. Computer fault tolerance; Memory fault tolerance

Disk drives

probabilistic limit on the virtual size of replicated disk systems. *Lo, Raymond Wai-Man, +, T-KDE Feb 92 99-102*

Distortion; cf. Delay effects

Distributed computing

development of distributed termination detection algorithms using message counting. *Kumar, Devendra, T-KDE Apr 92 145-155*

- optimal agreement protocol for distributed computing system with malicious faulty processors and faulty links. *Yan, Kuo-Qin, + , T-KDE Jun 92 266-280*
- organizational self-design of distributed production systems. *Ishida, Toru, + , T-KDE Apr 92 123-134*
- self-organizing knowledge and data representation in distributed environments (special issues). *T-KDE Apr 92 105-191*
- Distributed computing; cf.** Distributed database systems; Protocols...
- Distributed database management systems**
grid protocol for maintaining replicated data in distributed systems. *Cheung, Shun Yan, + , T-KDE Dec 92 582-592*
- Distributed database management systems; cf.** Distributed database systems, query processing
- Distributed database systems**
development of distributed termination detection algorithms using message counting. *Kumar, Devendra, T-KDE Apr 92 145-155*
- FAD, database programming language for manipulating transient and persistent data on Bubba parallel database system. *Danforth, Scott, + , T-KDE Feb 92 34-51*
- self-organizing knowledge representation scheme for extensible heterogeneous information environment. *Sull, Wonhee, + , T-KDE Apr 92 185-191*
- Distributed database systems; cf.** Distributed database management systems
- Distributed database systems, query processing**
data structure for efficient management of materialized generalized transitive closure in centralized and parallel environments. *Guh, Keh-Chang, + , T-KDE Aug 92 371-381*
- low-overhead delay method of adaptive strategy execution for distributed query processing. *Bodorik, Peter, + , T-KDE Jun 92 253-265*
- Distributed database systems, relational**
database management system for decomposing heterogeneous interentity relationship updates. *Horowitz, Jeffrey R., + , T-KDE Aug 92 360-370*
- Distributed information systems; cf.** Distributed database...
- Document handling; cf.** Information retrieval
- Drives; cf.** Disk drives

E

Expert systems

- COMPLEX, object-oriented logic programming system for development of knowledge-based applications. *Greco, Sergio, + , T-KDE Aug 92 344-359*
- information-theoretic approach to rule induction from databases. *Smyth, Padhraic, + , T-KDE Aug 92 301-316*
- KBMS, knowledge-based system for modeling software system specifications. *Zeroual, Kacem, + , T-KDE Jun 92 238-252*
- KDA, knowledge-based natural-language database assistant with query guiding facility. *Wu, Xu, + , T-KDE Oct 92 443-453*
- knowledge-intensive software engineering tools. *Rich, Charles, + , T-KDE Oct 92 424-430*
- multilayer perceptron solution to match phase problem in rule-based artificial intelligence systems. *Sartori, Michael A., + , T-KDE Jun 92 290-297*
- source-to-source transformation for increasing rule-based-system parallelism and improving execution time. *Pasik, Alexander J., T-KDE Aug 92 336-343*
- using relational database to support explanation in knowledge-based system. *Basu, Amit, + , T-KDE Dec 92 572-581*
- Expert systems; cf.** Intelligent systems

F

- Fault tolerance; cf.** Computer fault tolerance; Memory fault tolerance
- File systems; cf.** Database systems...; Information retrieval

G

Graph theory

- classification and compilation of linear recursive queries in deductive databases using graph models. *Youn, Cheong, + , T-KDE Feb 92 52-67*

I

Iconic languages; cf. Visual languages**IEEE Computer Society**

- celebrating 40th anniversary of IEEE Computer Society (special issue). *T-KDE Oct 92 405-502*

Image analysis

- ALIAS, adaptive-learning image analysis system for detecting anomalies in gray-scale images and signals. *Bock, Peter, + , T-KDE Apr 92 109-122*

Image boundary analysis; cf. Image region analysis**Image classification**

- generalization capabilities of subtle image pattern classifiers; application to whiplash thermographs. *Egbert, Dwight D., + , T-KDE Apr 92 172-177*

- unifying approach to iconic indexing for representing and matching 2-D and 3-D scenes. *Costagliola, Gennaro, + , T-KDE Jun 92 205-222*

Image classification; cf. Pattern recognition**Image databases**

- conceptual framework for image information systems using generalized icons and active indexes. *Chang, Shi-Kuo, + , T-KDE Oct 92 431-442*

- unifying approach to iconic indexing for representing and matching 2-D and 3-D scenes. *Costagliola, Gennaro, + , T-KDE Jun 92 205-222*

Image matching

- unifying approach to iconic indexing for representing and matching 2-D and 3-D scenes. *Costagliola, Gennaro, + , T-KDE Jun 92 205-222*

Image object recognition; cf. Object recognition**Image region analysis**

- recurrent cooperative/competitive field for segmentation of magnetic resonance brain images. *Worth, Andrew J., + , T-KDE Apr 92 156-161*

Image representations

- unifying approach to iconic indexing for representing and matching 2-D and 3-D scenes. *Costagliola, Gennaro, + , T-KDE Jun 92 205-222*

Image segmentation; cf. Image region analysis**Image storage; cf.** Image databases**Indexes**

- conceptual framework for image information systems using generalized icons and active indexes. *Chang, Shi-Kuo, + , T-KDE Oct 92 431-442*

- unifying approach to iconic indexing for representing and matching 2-D and 3-D scenes. *Costagliola, Gennaro, + , T-KDE Jun 92 205-222*

Information retrieval

- frame-sliced signature file superimposed coding method for text databases. *Lin, Zheng, + , T-KDE Jun 92 281-289*

- probabilistic limit on the virtual size of replicated disk systems. *Lo, Raymond Wai-Man, + , T-KDE Feb 92 99-102*

Information retrieval; cf. Database systems, searching**Information systems; cf.** Database systems; Indexes**Infrared imaging/mapping; cf.** Biomedical imaging, infrared**Intelligent systems**

- intelligent modeling system for planning problems based on constraint satisfaction. *Raghunathan, Srinivasan, T-KDE Aug 92 317-335*

- self-organizing knowledge and data representation in distributed environments (special issues). *T-KDE Apr 92 105-191*

K

- Knowledge-based systems; cf.** Expert systems; Learning systems

L

- Languages; cf.** Computer languages; Natural language systems; Stochastic languages; Visual languages

Learning systems

- ALIAS, adaptive-learning image analysis system for detecting anomalies in gray-scale images and signals. *Bock, Peter, + , T-KDE Apr 92 109-122*

- information-theoretic approach to rule induction from databases. *Smyth, Padhraic, + , T-KDE Aug 92 301-316*

- multilayer perceptron solution to match phase problem in rule-based artificial intelligence systems. *Sartori, Michael A., + , T-KDE Jun 92 290-297*

- population-based learning-from-examples method for designing heuristics automatically under resource constraints. *Wah, Benjamin W., T-KDE Oct 92 454-474*

Learning systems; cf. Neural networks**Logic**

- vectorization of generalized procedure for theorem proving in propositional logic on vector computers. *Fang, Ming-Yi, + , T-KDE Oct 92 475-486*

Logic programming

- COMPLEX, object-oriented logic programming system for development of knowledge-based applications. *Greco, Sergio, + , T-KDE Aug 92 344-359*

M

- Machine vision; cf.** Image analysis; Object recognition
- Magnetic resonance imaging; cf.** Biomedical imaging, MRI
- Manufacturing planning**
intelligent modeling system for planning problems based on constraint satisfaction. *Raghunathan, Srinivasan, T-KDE Aug 92 317-335*
- Matching; cf.** Image matching
- Memory fault tolerance**
incremental recovery in main-memory database systems. *Levy, Eliezer, +, T-KDE Dec 92 529-540*
measuring performance of main memory database recovery algorithms based on update-in-place and shadow approaches. *Kumar, Vijay, +, T-KDE Dec 92 567-571*
- Memory management**
evaluation of Starburst database's memory-resident storage component. *Lehman, Tobin J., +, T-KDE Dec 92 555-566*
grid protocol for maintaining replicated data in distributed systems. *Cheung, Shun Yan, +, T-KDE Dec 92 582-592*
survey of major memory residence optimization and main memory database systems. *Garcia-Molina, Hector, +, T-KDE Dec 92 509-516*
- Memory management; cf.** Database management systems
- Modeling**
intelligent modeling system for planning problems based on constraint satisfaction. *Raghunathan, Srinivasan, T-KDE Aug 92 317-335*
KBMS, knowledge-based system for modeling software system specifications. *Zeroual, Kacem, +, T-KDE Jun 92 238-252*
- Modeling; cf.** Data models
- MRI; cf.** Biomedical imaging, MRI
- Multiprocessing**
data structure for efficient management of materialized generalized transitive closure in centralized and parallel environments. *Guh, Keh-Chang, +, T-KDE Aug 92 371-381*
design and implementation of PRISMA/DB parallel, main-memory relational DBMS. *Apers, Peter M. G., +, T-KDE Dec 92 541-554*
source-to-source transformation for increasing rule-based-system parallelism and improving execution time. *Pasik, Alexander J., T-KDE Aug 92 336-343*
- Multiprocessing; cf.** Neural networks; Vector processing

N

- Natural language systems**
KDA, knowledge-based natural-language database assistant with query guiding facility. *Wu, Xu, +, T-KDE Oct 92 443-453*
- Natural language systems; cf.** Query languages
- Neural network applications; cf.** Specific topic
- Neural networks**
automatic target recognition using neocognitron. *Himes, Glenn S., +, T-KDE Apr 92 167-172*
formal protocols for error tolerance in neural networks and resulting gains in capacity. *Venkatesh, Santosh S., T-KDE Apr 92 135-144*
generalization capabilities of subtle image pattern classifiers; application to whiplash thermographs. *Egbert, Dwight D., +, T-KDE Apr 92 172-177*
generalization using neural-network stochastic backpropagation learning algorithm based on simulated annealing in weight space. *Shekhar, Shashi, +, T-KDE Apr 92 177-185*
multilayered self-organizing artificial neural network for invariant pattern recognition. *Minnix, Jay I., +, T-KDE Apr 92 162-167*
multilayer perceptron solution to match phase problem in rule-based artificial intelligence systems. *Sartori, Michael A., +, T-KDE Jun 92 290-297*
- Nuclear magnetic resonance imaging; cf.** Biomedical imaging, MRI

O

- Object-oriented databases**
characteristics of object-oriented query languages and comparison with relational query languages. *Bertino, Elisa, +, T-KDE Jun 92 223-237*
framework for executing set operations in object-based data models. *Rundensteiner, Elke A., +, T-KDE Aug 92 382-398*
main-memory-oriented optimization of object-oriented queries using typed Datalog with foreign predicates. *Litwin, Witold, +, T-KDE Dec 92 517-528*
self-organizing knowledge representation scheme for extensible heterogeneous information environment. *Sull, Wonhee, +, T-KDE Apr 92 185-191*
system-guided view integration for object-oriented-database design. *Gotthard, Willi, +, T-KDE Feb 92 1-22*

Object-oriented programming

- COMPLEX, object-oriented logic programming system for development of knowledge-based applications. *Greco, Sergio, +, T-KDE Aug 92 344-359*
- FAD, database programming language for manipulating transient and persistent data on Bubba parallel database system. *Danforth, Scott, +, T-KDE Feb 92 34-51*
- Object recognition**
automatic target recognition using neocognitron. *Himes, Glenn S., +, T-KDE Apr 92 167-172*
- Optimization methods; cf.** Simulated annealing

P

- Parallel processing; cf.** Multiprocessing
- Pattern classification; cf.** Image classification
- Pattern matching; cf.** Image matching
- Pattern recognition**
multilayered self-organizing artificial neural network for invariant pattern recognition. *Minnix, Jay I., +, T-KDE Apr 92 162-167*
- Pattern recognition; cf.** Image classification; Object recognition
- Perceptrons; cf.** Neural networks
- Pipeline processing; cf.** Vector processing
- Planning**
multilayer perceptron solution to match phase problem in rule-based artificial intelligence systems. *Sartori, Michael A., +, T-KDE Jun 92 290-297*
- Planning; cf.** Manufacturing planning
- Probabilistic languages; cf.** Stochastic languages
- Problem-solving**
organizational self-design of distributed production systems. *Ishida, Toru, +, T-KDE Apr 92 123-134*
- Production systems**
multilayer perceptron solution to match phase problem in rule-based artificial intelligence systems. *Sartori, Michael A., +, T-KDE Jun 92 290-297*
organizational self-design of distributed production systems. *Ishida, Toru, +, T-KDE Apr 92 123-134*
- Productivity; cf.** Software development management
- Programming; cf.** Logic programming; Object-oriented programming
- Project management; cf.** Software development management
- Protocols**
formal protocols for error tolerance in neural networks and resulting gains in capacity. *Venkatesh, Santosh S., T-KDE Apr 92 135-144*
optimal agreement protocol for distributed computing system with malicious faulty processors and faulty links. *Yan, Kuo-Qin, +, T-KDE Jun 92 266-280*
- Protocols, memory; cf.** Memory management

Q

Query languages

- characteristics of object-oriented query languages and comparison with relational query languages. *Bertino, Elisa, +, T-KDE Jun 92 223-237*
comments, with reply, on 'Extensions to SQL for historical databases' by N. L. Sarda. *Johnson, R. G., +, T-KDE Aug 92 399* (Original paper, Apr 90 220-230)
- KDA, knowledge-based natural-language database assistant with query guiding facility. *Wu, Xu, +, T-KDE Oct 92 443-453*
- main-memory-oriented optimization of object-oriented queries using typed Datalog with foreign predicates. *Litwin, Witold, +, T-KDE Dec 92 517-528*
- queries on change in extended relational model. *Jensen, Christian S., +, T-KDE Apr 92 192-200*
- universal relation data model with semantic abstractions. *Chang, Tzy-Hey, +, T-KDE Feb 92 23-33*

Query languages; cf. Database systems, searching

R

Relaxation methods; cf. Simulated annealing

Rule-based systems; cf. Expert systems

S

Search methods; cf. Database systems, searching

Set theory

framework for executing set operations in object-based data models.
Rundensteiner, Elke A., + , T-KDE Aug 92 382-398

Signal representations; cf. Image representations

Simulated annealing

generalization using neural-network stochastic backpropagation learning
algorithm based on simulated annealing in weight space. *Shekhar, Shashi, + , T-KDE Apr 92 177-185*

Software; cf. Computer languages; Database management systems;
Distributed database management systems

Software design/development

system-guided view integration for object-oriented-database design.
Gotthard, Willi, + , T-KDE Feb 92 1-22

Software development environments; cf. Computer-aided software
engineering; Logic programming

Software development management

applying concurrent engineering concepts to software development
process. *Yeh, Raymond T., T-KDE Oct 92 407-414*

Software performance; cf. Computation time

Software requirements and specifications

KBMS, knowledge-based system for modeling software system
specifications. *Zeroual, Kacem, + , T-KDE Jun 92 238-252*

Special issues/sections

celebrating 40th anniversary of IEEE Computer Society. *T-KDE Oct 92 405-502*

main memory databases (special section). *T-KDE Dec 92 507-571*

self-organizing knowledge and data representation in distributed
environments. *T-KDE Apr 92 105-191*

Stochastic languages

probabilistic relational data model for representing probabilities
associated with values of attributes. *Barbará, Daniel, + , T-KDE Oct 92 487-502*

Stochastic processes

generalization using neural-network stochastic backpropagation learning
algorithm based on simulated annealing in weight space. *Shekhar, Shashi, + , T-KDE Apr 92 177-185*

T

Target recognition; cf. Object recognition

Theorem proving; cf. Artificial intelligence

V

Vector processing

vectorization of generalized procedure for theorem proving in
propositional logic on vector computers. *Fang, Ming-Yi, + , T-KDE Oct 92 475-486*

Visual languages

conceptual framework for image information systems using generalized
icons and active indexes. *Chang, Shi-Kuo, + , T-KDE Oct 92 431-442*

Information for Authors

The IEEE TRANSACTIONS ON KNOWLEDGE AND DATA ENGINEERING is an archival journal published quarterly. The information published in this TRANSACTIONS is designed to inform researchers, developers, managers, strategic planners, users, and others interested in state-of-the-art and state-of-the-practice activities in the knowledge and data engineering area. We are interested in well-defined theoretical results and empirical studies that have potential impact on the acquisition, management, storage, and graceful degeneration of knowledge and data; as well as in provision of knowledge and data services. We welcome treatments of the role of knowledge and data in the development and use of information systems and in the simplification of software and hardware development and maintenance. Since the journal is archival, it is assumed that the ideas presented are important, have been well analyzed and/or empirically validated, and are of value to the knowledge and data engineering research community.

Specific topics include, but are not limited to: a) artificial intelligence techniques, including speech, voice, graphics, images, and documents; b) knowledge and data engineering tools and techniques; c) parallel and distributed processing; d) real-time distributed processing; e) system architectures, integration, and modeling; f) database design, modeling, and management; g) query design, and implementation languages; h) distributed database control; i) statistical databases; j) algorithms for data and knowledge management; k) performance evaluation of algorithms and systems; l) data communications aspects; m) system applications and experience; n) knowledge-based and expert systems; and o) integrity, security, and fault tolerance.

Papers that may be submitted for consideration include those that have not previously been published in another journal, or are not currently being published or reviewed, as well as those that have been published in Conference Proceedings, Digests, and Records and that have undergone substantial revision. The author is responsible for obtaining all necessary copyright releases for copyrighted material which has appeared in non-IEEE publications. It is IEEE's policy (policy 6.16) to assume that all clearances have been received by the author by the time a paper is submitted for publication.

Delays can be minimized by preparing the manuscript according to the following suggestions.

A. Process of Submission of a Technical Paper and/or Proposal of a Special Issue

- 1) For invited papers, six copies, complete with illustrations, abstract, and index terms, should be sent to the Editor-in-Chief, Dr. C. V. Ramamoorthy.
- 2) Proposals for special issues should initially be discussed informally with Dr. Ramamoorthy. After positive feedback, a proposal which includes the following components should be submitted: a) aim; b) audience, or who will benefit; c) topics covered; d) possible authors and titles; e) possible reviewers for submitted papers; f) target date for submission of papers; g) vitae for parties proposing the issue. All proposals will be reviewed by members of the TRANSACTIONS Editorial Board.
- 3) For papers to be considered for regular issues, six copies of the manuscript, each complete with illustrations, abstract, and index terms, should be sent to the Associate Editor-in-Chief, Dr. Benjamin Wah.
- 4) Enclose a signed IEEE copyright transfer form with each manuscript.
- 5) Enclose with each manuscript, on a separate page, from five to ten index terms (key phrases). These terms should be relatively independent (coordinate index terms), and as a group should optimally characterize the paper.
- 6) Enclose originals for the illustrations, in the style described below. Alternately, good quality copies may be sent initially, with the originals ready to be sent immediately upon acceptance of the paper.
- 7) Enclose a separate page giving your telephone number and preferred address for correspondence and return of proofs.
- 8) Enclose a technical biography and a photograph of each author of the paper or be ready to supply these upon acceptance of the paper. Biographies and photographs will only be published in full papers and not in concise papers or correspondence. For biography style, see an IEEE TRANSACTIONS.
- 9) The referee process assures the anonymity of the reviewers of your paper. It is also possible to provide a review in which the author's identity is kept from the reviewers. Should you wish to take advantage of this provision, please make your desires explicit in this regard in your cover letter to the Editor-in-Chief. In this case, your name must appear only on a removable cover page.

B. Style for Manuscript

- 1) Typewrite and double space; use one side of sheet only. (Good office-duplicate copies are acceptable.) Papers should be printed using fonts of 10 points or larger and spacing of 18 points or larger. Typical length of regular papers is 25-35 double-spaced pages, including figures, tables, and references, that of concise papers is 12 pages, and that of correspondence items is 4 pages.
 - 2) Provide an informative 100-to-250 word abstract and index terms in alphabetical order at the head of the manuscript. A concise paper requires an abstract of 100-to-150 words, and a correspondence requires 50 words or less. The abstracts are printed with the articles.
 - 3) Provide a separate double-spaced sheet listing all footnotes, beginning with "Affiliation of author" and continuing with numbered references. Acknowledgment of financial support may be given, if appropriate.
 - 4) References should be numbered and appear in a separate bibliography at the end of the paper. Use numerals in square brackets to cite references, e.g., [15]. References should be complete, in IEEE style, and in general should be accessible to our readers.
- Style for papers:* Author, first initials followed by last name, title, volume, page numbers, month and year.
- Style for books:* Author, title, publisher and location, year, chapter or page numbers (if desired).
- (See this issue for further examples.)
- 5) Provide a separate sheet listing all figure captions, in proper style for the typesetter, e.g., "Fig. 1. Example of a disjoint and distraught manifold."
 - 6) Provide magnetic media before final publication. This is strongly recommended as it saves the cost of production. IEEE can accept the following types of magnetic media: a) any IBM-PC disk format 5.25"/360K/1.2MB or 3.5"/720K/1.44MB (DS/DD, DS/HD, DS/QD, etc.), b) Macintosh disk format, c) 0.25" magnetic tape cartridges (UNIX workstations: tar, dump), d) 3.5" floppy diskette (UNIX workstations: tar, dump).

IEEE can accept manuscripts generated with the following word processors:

Microsoft Word (please include any nondefault type styles).	WordPerfect (all versions)	Multimate
Wordstar 2000	ASCII files generated by any editor	Wordstar (all versions)
DCA/RFT	Displaywrite	DCS/FFT
Volkwriter 3	Wang IWP	Samma
Sprint	WordMac	CEOWrite
Officewriter 6.0	DIF	DX
TEX,LaTEX	ProWrite 1.0/2.0	Interleaf
	nroff, troff	

Alternatively, authors can send files by electronic mail to the Associate Editor-in-Chief.

IMPORTANT: If you have written some macros that are required to produce your hard-copy, please make them available on your magnetic media, and include them with your submissions.

7) For further information see "Information for IEEE Transactions and Journal Authors," available from the IEEE Publications Department, 345 East 47 Street, New York, NY 10017.

C. Style for Illustrations

- 1) Originals for illustrations (including tables) should be sharp, noise-free, and of good contrast. We regret that we cannot provide drafting or art services.
- 2) Line drawings should be in black ink on white background. Use 8 1/2 by 11-inch size sheets if possible, to simplify handling of the manuscript.
- 3) On graphs, show only the coordinate axes, or at most the major grid lines, to avoid a dense, hard-to-read result.
- 4) All lettering should be large enough to permit legible reduction of the figure to column width, perhaps as much as 4 to 1.
- 5) Photographs should be glossy prints, of good contrast and gradation, and any reasonable size.
- 6) Number each original on the back, or at the bottom of the front.
- 7) Note item B-5) above. Captions lettered on figures will be blocked out in reproduction in favor of typeset captions.

Page Charges: After a manuscript has been accepted for publication, the author's company or institution will be requested to pay a page charge of \$110 per printed page to cover part of the cost of publication. Page charges for the IEEE TRANSACTIONS are not obligatory nor is their payment a prerequisite for publication. The author will receive 100 free reprints without covers if the charge is honored. Detailed instructions will accompany the proof. Administration of the page charges is handled by the New York office, and the editorial staff of this TRANSACTIONS has no connection with it.

THE FOLLOWING INFORMATION IS AVAILABLE:

Contact the Publications Office;
to facilitate handling, please request by number.

- Membership application, student #203, others #202
- Periodicals subscription form for individuals #200
- Periodicals subscription form for organizations #199
- Publications catalog #201
- Compmail electronic mail brochure #194
- Technical committee list/application #197
- Chapters lists, start-up procedures #193
- Student scholarship information #192
- Volunteer leaders/staff directory #196
- IEEE senior member grade application #204

(requires ten years practice and significant performance in five of those ten)

To check membership status or report a change of address, call the IEEE toll-free number, 1-800-678-4333. Direct all other Computer Society related questions to the Publications Office.

PURPOSE

The IEEE Computer Society advances the theory and practice of computer science and engineering, promotes the exchange of technical information among 100,000 members worldwide, and provides a wide range of services to members and nonmembers.

MEMBERSHIP

Members receive the acclaimed monthly magazine *Computer*, discounts, and opportunities to serve (all activities are led by volunteer members). Membership is open to all IEEE members, affiliate society members, and others interested in the computer field.



IEEE COMPUTER SOCIETY®

A member society of the
Institute of Electrical and Electronics Engineers, Inc.

PUBLICATIONS AND ACTIVITIES

Computer. An authoritative, easy-to-read magazine containing tutorial and in-depth articles on topics across the computer field, plus news, conferences, calendar, interviews, and product reviews.

Periodicals. The society publishes seven magazines and five research transactions. Refer to membership application or request information as noted above.

Conference Proceedings, Tutorial Texts, Standard Documents. The Computer Society Press publishes more than 100 titles every year.

Standards Working Groups. Over 100 of these groups produce IEEE standards used throughout the industrial world.

Technical Committees. More than 30 TCs publish newsletters, provide interaction with peers in specialty areas, and directly influence standards, conferences, and education.

Conferences/Education. The society holds about 100 conferences each year and sponsors many educational activities, including computing science accreditation.

Chapters. Regular and student chapters worldwide provide the opportunity to interact with colleagues, hear technical experts, and serve the local professional community.

OMBUDSMAN

Members experiencing problems — magazine delivery, membership status, or unresolved complaints — may write to the ombudsman at the Publications Office.

EXECUTIVE COMMITTEE

President: Bruce D. Shriver*
17 Bethea Drive
Ossining, NY 10562
Phone: (914) 762-3251
Fax: (914) 941-9181

President-Elect: James H. Aylor*
Past President: Duncan H. Lawrie*

VP, Conferences and Tutorials: Barry W. Johnson (1st VP)*
VP, Educational Activities: Raymond E. Miller (2nd VP)*
VP, Membership Activities: Fiorenza C. Albert-Howard*
VP, Press Activities: Yale N. Patt*
VP, Publications: Harold S. Stone*
VP, Standards Activities: Gary Robinson†
VP, Technical Activities: Joseph Boykin†

Secretary: Ronald G. Hoelzeman*
Treasurer: Laurel V. Kaleda†
IEEE Division V Director: Bill D. Carroll†
IEEE Division VIII Director: Helen M. Wood†
Executive Director: T. Michael Elliott†

*voting member of the Board of Governors

†nonvoting member of the Board of Governors

BOARD OF GOVERNORS

Term Expiring 1992:

Alicja I. Ellis, Ronald G. Hoelzeman, Tadao Ichikawa,
C.V. Ramamoorthy, Sallie V. Sheppard,
Harold Stone, Akihiko Yamada

Term Expiring 1993:

Fiorenza Albert-Howard, Jon T. Butler, Michael C. Mulder,
Yale N. Patt, Anneliese von Mayrhauser,
Benjamin W. Wah, Ronald Waxman

Term Expiring 1994:

Mario R. Barbacci, Luis-Felipe Cabrera, Wolfgang K. Giloi,
Guyline M. Pollock, John P. Riganati, Ronald D. Williams,
Thomas W. Williams

SENIOR STAFF

Executive Director: T. Michael Elliott
Publisher: H. True Seaborn
Director, Conferences and Tutorials: Anne Marie Kelly
Director, Finance and Information Services: Tod S. Heisler
Director, Board and Administrative Services: Violet S. Doan
Assistant to the Executive Director: Sandra K. Plau

COMPUTER SOCIETY OFFICES

Headquarters Office

1730 Massachusetts Ave. NW
Washington, DC 20036-1903
Phone: (202) 371-0101
Fax: (202) 728-9614

Publications Office

10662 Los Vaqueros Cir.
PO Box 3014
Los Alamitos, CA 90720-1264
Membership and General Information:
(714) 821-8380
Publication Orders: (800) 272-6657
Fax: (714) 821-4010

European Office

13, Ave. de L'Aquilon
B-1200 Brussels, Belgium
Phone: 32 (2) 770-21-98
Fax: 32 (2) 770-85-05

Asian Office

Ooshima Building
2-19-1 Minami-Aoyama, Minato-ku
Tokyo 107, Japan
Phone: 81 (3) 3408-3118
Fax: 81 (3) 3408-3553